

Shueta  
Belra

**MCT**  
MANJARA CHARITABLE TRUST  
**RAJIV GANDHI INSTITUTE OF TECHNOLOGY**  
Department of Applied Sciences and Humanities

UNIT-TEST-II 2015 (Sem- II)

Time:1 Hour

Sub: Applied Mathematics -II

Marks :20

Q.1 Solve any five

(10)

a) Evaluate  $\int_0^{\infty} \frac{x^4}{4^x} dx$

b) Prove that  $\int_0^{\infty} \frac{e^{-ax} - e^{-bx}}{x} dx = \log\left(\frac{b}{a}\right)$ ,  $a > 0, b > 0$ .

c) Evaluate  $\int_0^1 \int_0^{x^2} e^{y/x} dx$

d) Change into Beta function  $\int_0^2 x^2 (2-x)^{1/3} dx$

e) Change the order of integration  $\int_0^a \int_x^{a^2/x} f(x,y) dx dy$

f) Evaluate  $\int_0^{\infty} \frac{x^{10} - x^{18}}{(1+x)^{30}} dx$

0.11.11  
11/11/11

Q.2 Find the total length of the loop of the curve  $9y^2 = (x+7)(x+4)^2$  (5)

OR

Q.2 Change the order of integration & evaluate  $\int_0^1 \int_x^{\sqrt{2-x^2}} \frac{x}{\sqrt{x^2+y^2}} dx dy$  (5)

Q.3 Change to polar co-ordinate & evaluate  $\int_0^1 \int_0^x (x+y) dx dy$  (5)

OR

Q.3 Find by double integration the area inside the circle  $r = a \sin(\theta)$  & outside the cardioid  $r = a(1 - \cos(\theta))$ . (5)